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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,324	05/09/2001	Kohei Tatsumi	1776/00057	2805

7590 08/29/2002
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EXAMINER
BEREZNY, NEAL

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 08/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/851,324

Applicant(s)

TATSUMI ET AL.

Examiner

Neal Berezny

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-21 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/350,125.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 5/9/01 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. No copy has been found in neither the parent nor the instant application.

Claim Objections

2. Claim 16 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 16 includes a limitation that the transfer is "regulated". Such a limitation does not further limit the claim because it is inherent that the transfer is regulated, given the broadest interpretation of the term.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. The term "regulated" is vague and indefinite because it fails to specify how the transfer is to be regulated.

5. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "at once" is vague and indefinite because it fails to provide guidance as to how long "at once" means.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 15-17, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (5,955,776) in combination with Kanatake (6,178,654). Ishikawa teaches building a spherical semiconductor device, fig.25, el 2502, having spherical bumps, el. 2518, on surface electrodes of a spherical semiconductor element, col.14, ln.6-8, arranging conductive balls for forming said spherical bumps, at positions corresponding to said surface electrodes, col.13, ln.67 to col.14, ln.3, the position of each of said conductive balls on said arrangement substrate is regulated to join the electrodes, col.14, ln.18-26. Ishikawa appears not to specifically teach the method steps of using an arrangement substrate and having a gap between the arrangement substrate and the semiconductor element. Kanatake teaches the method steps of using an arrangement substrate and having a gap between the arrangement substrate and the

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semiconductor element, fig.4, col.3, ln.1-4. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Kanatake with Ishikawa to form a process of forming solder balls on spherical semiconductor elements using a temporary arrangement substrate to align the spherical device for a variety of processing steps, col.2, ln.5-10, in order to connect the device to an external environment, and to form a gap in between in order to facilitate moving the sphere without damaging it.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa and Kanatake as applied to claims 15-17, 21 above, and further in view of Hotchkiss (5,028,546). Ishikawa and Kanatake appear not to specifically teach joining the conductive balls by a thermocompression bonding process. Hotchkiss teaches joining solder balls to electrodes by a thermocompression process, col.2, ln.35-39. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Hotchkiss with Ishikawa and Kanatake to use the well known thermocompression process to bond the solder balls to the electrodes in order to provide an economical and efficient means of making contact with external devices.

9. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa and Kanatake as applied to claims 15-17, 21 above, and further in view of Yeh et al. (5,803,340). Ishikawa and Kanatake appear not to specifically teach forming bumps by melting the solderballs to the electrodes, nor coating the balls with a flux. Yeh teaches forming bumps by melting the solderballs to the electrodes, and coating the balls with a flux. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Yeh with Ishikawa and Kanatake, to forming bumps by the well

known method of melting the solderballs to the electrodes, in order to provide an efficient and economical means of making contact to external circuits. Further, it would be obvious to one of ordinary skill in the art at the time of the invention to also combine Yeh with Ishikawa and Kanatake to coat the balls with a flux to reduce oxidation of the solder during the bonding process.


CONCLUSION

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached at (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800


8-26-02
Neal Berezny
Patent Examiner
Art Unit 2823